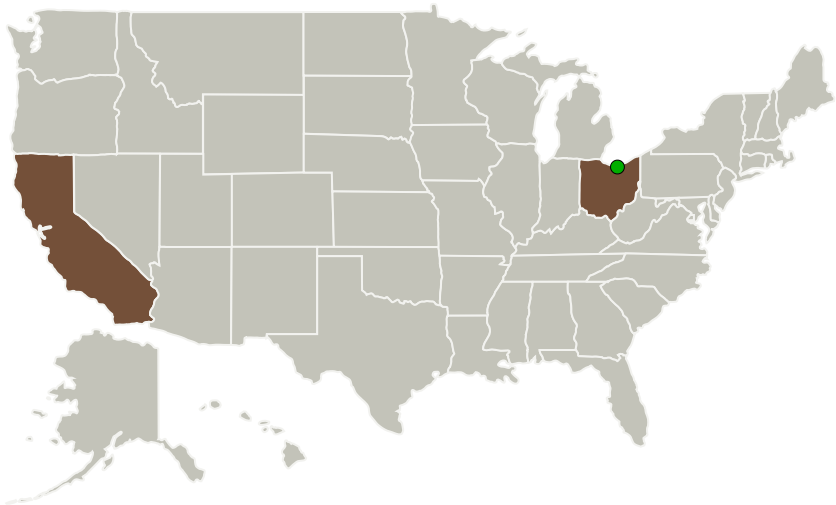
Automated High-Volume Manufacturing of Modular Photovoltaic Panel Assemblies for Space Solar Arrays, Phase I

Completed Technology Project (2013 - 2013)

Project Introduction

Deployable Space Systems, Inc. (DSS) will focus the proposed SBIR program on the creation and development of an automated robotic manufacturing infrastructure designed to mass-produce DSS's Integrated Modular Blanket Assembly (IMBA) common photovoltaic Standard Power Modules (SPM's). The proposed development will implement automated manufacturing processes for CIC-ing, glassing, stringing, laydown, and acceptance testing of interconnected photovoltaic devices onto an ultra-lightweight IMBA/SPM modular flexible blanket assembly through simple and commercially available pick-and-place robotic manufacturing techniques / infrastructure. Automated manufacturing of IMBA/SPM photovoltaic panel assemblies will provide an industry paradigm shift for affordability / cost-savings when compared to current labor intensive manufacturing processes. Unlike the current industry approach which is only focused on increasing the device area that only minimally reduces panel assembly costs, the proposed automated manufacturing will attack the highest cost and most labor intensive components of manufacturing a panel assembly, namely; CICing, glassing, stringing, panel laydown, and acceptance testing. By incorporating automated manufacturing the proposed IMBA/SPM photovoltaic flexible blanket assembly promises to provide ultra-affordable high-performance and repeatable high-quality modules for future NASA Space Science and Exploration missions, and particularly for ultra-high-power SEP missions.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Deployable Space Systems, Inc (DSS)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

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Organizations Performing Work	Role	Type	Location
Deployable Space Systems, Inc(DSS)	Lead Organization	Industry	Goleta, California
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

Project Transitions

May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140420)*

Images

Project Image
Automated High-Volume Manufacturing of Modular Photovoltaic Panel Assemblies for Space Solar Arrays
(https://techport.nasa.gov/image/130409)

Project Management *(cont.)*

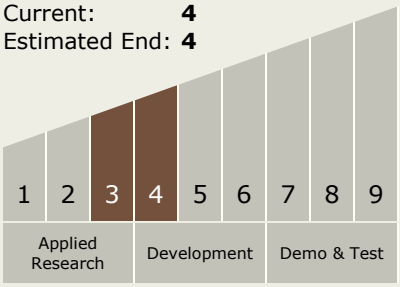
Program Manager:
Carlos Torrez

Principal Investigator:
Brian R Spence

Co-Investigator:
Brian Spence

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.1 Photovoltaic

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Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System